



Sharpener

BACKGROUND

The invention concerns a sharpener for pencils having a ~~color-cartridge,~~
lead, such as graphite pencils, crayons and in particular cosmetic pencils and similar
items.

Existing sharpeners have a housing with an opening into which a pencil to
5 be sharpened can be inserted. The one end of this pencil thereby comes into contact with
a cutting an-edge arranged at an angle to the length axis of the pencil so that a rotating
movement or a screw-like movement of the pencil creates a conical point at the end of the
pencil around its length axis.

These familiar sharpeners can be used for sharpening pencils with an
10 essentially cylindrical ~~color-cartridge~~pencil lead that have a carrier body surrounding the
~~color-cartridge,~~ lead, which is usually made of wood and has a circular or hexagonal
cross-section.

For many types of pencils, in particular cosmetic pencils and similar items,
there is a desire to shape a point that is non-conical. This is due in part to the fact that the
15 material used for this point is very soft and that, on the one hand, there is desire for
steady positioning of the ~~color shaft-~~lead and, on the other hand, for a contact surface that
is not too large for application of the material from the point.

The task of the invention, therefore, is to create a sharpener for sharpening
pencils, which is technically configured in a different manner. In particular, the task of
20 the invention is to create a sharpener for sharpening pencils that can be used to sharpen

pencils that have essentially any type of carrier body cross-section and can sharpen the point on the ~~color-cartridge~~lead in a reliable manner.

SUMMARY

5 In accordance with the invention, a pencil sharpener is proposed that has a cutting device, a holding device for the pencil—a, at least one housing and a ~~force-~~feedingforcible guide device.

In accordance with the invention, the pencil is received in particular by the holding device. The holding device thereby preferably grabs the pencil ~~around~~about its exterior. The holding device is arranged within the sharpener ~~is-in~~ such a way that a free end of the pencil, the end that will be sharpened, is located outside of the holding device so that the cutting device can make contact with it. Preferably, the pencil will be held inside ~~of~~ the holding device in a rotationally fixed manner so that rotation around an axis parallel to its length axis ~~will-be~~is prevented. It is especially preferred that the pencil to be sharpened is received in the holding device in a form-fitting manner. Preferably the pencil will be placed in the holding device so that it may move in an axial direction with respect to its length axis and so that it can be moved in the direction of the cutting device.

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15

The housing will preferably have at least two housing parts, of which one will be a lid. The housing parts are connected with one another. In particular the housing parts are welded, specifically using ultrasound welding, glued or screwed together.

20

The ~~force-feed~~forcible guide device has at least one ~~feed-guide~~ element and at least one ~~feed-guide~~ track in which the ~~feed-guide~~ element is ~~force-feed~~forcibly guided upon sharpening of the pencil.

The ~~feed-guide~~ track is formed in particular from a cam or at least contains such a cam. Especially preferred is to form the ~~feed-guide~~ track ~~using as~~ a groove. It is preferred that the ~~feed-guide~~ track is formed ~~from a threading~~ by a profiling. Especially preferred is to form the ~~feed-guide~~ track from a groove that has a constant or varying
5 groove depth. A ~~force-feed~~ forcible guide that is realized by means of a varying groove depth or a ~~force-feed~~ forcible guide realized by means of the groove ~~path-path~~, or the combination of these ~~force-feeds~~ forcible guides is particularly preferred in accordance with this invention.

According to a particularly preferred configuration of the invention, there is
10 a disk that stretches concentrically around the holding device, which can hold the pencil whereby there is a groove with a varying groove depth running along the perimeter on the exterior of this disk so that at least one ~~feed-pencil~~ guide pin that is connected with the housing ~~extends in and the position of the pencil or the holding device opposite~~ engages
this groove and changes the position of the pencil or the holding device relative to the
15 housing ~~changes in accordance with a predetermined characteristics~~ characteristic.

It is especially preferred to arrange grooves on one or both ~~end-walls~~
~~grooves on~~ faces of a disk that ~~stretches~~ extends concentrically around the holding device,
into which ~~feed-pencil~~ guide pins connected solidly to the housing ~~extend~~ extend,
whereby these grooves match with respect to their paths or ~~are at least distinguished~~
20 by differ in their path.

The ~~feed-guide~~ track or ~~the~~ groove is a closed track. The ~~feed-guide~~ element is particularly preferred to be formed as a ~~feed-pencil,guide pin~~, which is specifically ~~fed-to~~ guided in a groove.

Several differently shaped ~~feed-guide~~ tracks are preferable.

5 Already the use of a ~~feed~~one guide groove offers the advantage of being able to guide the holding device in a predetermined manner upon rotation around the axis.

10 The use of two ~~feed-guide~~ grooves that are arranged on both sides of the disk-shaped seat of the holding device and into which ~~the respective pencil that is connected-a pin solidly connected~~ with the housing ~~reaches, respectively extends~~, offers the significant advantage that the movement track of the pencil can be selected in any manner ~~opposite~~ relative to the knife fastened to the housing.

15 For an elliptical pencil, it is preferably the case that one ~~feed-guide~~ track ensures that the pencil can be moved up and down whereas the other ~~feed-guide~~ track causes the pencil to be moved ~~against the blade to~~ and then away from the blade. This creates a chisel-shaped cutting edge that can be used with thick color pencils or cosmetic pencils to great advantage.

20 In particular, a ~~well-suited~~suitable selection of ~~feed-guide~~ grooves can ensure that the position of the ~~color-cartridge~~lead against the blade is optimal and, in particular, that the free angle ~~need~~ needed for a good cut will be in the respective optimal range.

A sharpener as described in the invention can be used in particular for pencils that have a ~~random shaped color cartridge at its cross section~~lead that is randomly shaped in cross-section. This ~~color cartridge~~lead can, in particular, be formed in a non-rotational symmetrical manner. Preferably the cross-section of this ~~color cartridge~~lead will ~~have~~has an elliptical shape. The ~~cartridge lead~~ carrier can also have essentially any shape and, in particular, ~~have an elliptical shape~~.

In addition, a sharpener as described in the invention can be ~~used~~used, in particular, ~~for a number of other shapes, in particular corresponding according to the shape of its force feed forcible guide device, of the color cartridge carrier,~~device for a number of other shapes of the lead carrier, which, in particular, has a wood cover essentially running along the ~~color cartridge~~lead axis, ~~which surrounds the color cartridge and surrounding the lead axis~~ and thereby offers special protection to ~~especially protecting it~~.

Especially preferred are two grooves on the respective ~~end walls,~~faces, which serve to guide a ~~pencil pin~~ placed firmly in the housing.

~~Especially preferred is arrangement of the cutting device,~~ The cutting arrangement, i.e. specifically the blade, is preferably in a fixed manner opposite relative to the housing. Especially preferred is a rigid connection of the blade ~~in a fixed manner~~ with the housing, which in particular is achieved by means of a screw connection or similar type of connection.

It is preferred that the pencil is received in the holding device in a rotationally fixed manner in relation to its length axis whereby the holding device, along

with the pencil, is arranged ~~opposite~~ for movement relative to the cutting device ~~so it can~~
~~move~~. The pencil ~~will~~ is preferably ~~be~~ received in the holding device in a form-fitting
manner. ~~Upon~~ During sharpening of the pencil, the holding device, and thereby the
pencil ~~will move opposite~~ are moved relative to the cutting device.

5 The pencil ~~will~~ is preferably ~~be~~ axially movably received in the holding
device so that it may can be moved ~~in an axial direction so that it can be moved~~ in the
direction of the cutting device and the cutting surface of the pencil can be shaped by
means of a rotating movement of the pencil relative to the cutting device.

10 In accordance with an especially advantageous configuration of the
invention, the ~~force-feed~~ forcible guide device or the path of the groove, into which a
~~pencil pin~~ reaches, or the cam is formed ~~is in~~ such a way that the free angle upon
sharpening is constantly between 2° and 10° , preferably mainly between 3° and 5° , and is
especially preferred to be 3° . The free angle is preferably held constant during
sharpening of the pencil. It is also preferred that the free angle ~~lies~~ remains within an
15 interval of 1° when sharpening.

 It is preferable that the sharpener has a sealing device. This sealing device
specifically insulates the ~~feed-guide~~ tracks so that the ~~feeding-guiding~~ mechanism does
not become hindered by invasive materials, such as shavings or similar materials.

20 The sealing disk is, in particular, made of a material that has POM or
polyamide or Derin or Hostaform, whereby Derin and Hostaform are product names.

 The sharpener ~~also especially~~ has a ~~feed-guide~~ track that ~~makes it possible~~
~~to sharpen~~ allows for the sharpening of an elliptical pencil with ellipse ratios of essentially

1.3:1 through 1.6:1 with an essentially free angle ~~that remains equal~~. It is especially preferred that ~~that the~~ ellipse ratio of the pencil is essentially 1.45:1. Other ellipse ratios ~~are also preferred for~~ as well as other shapes of the pencil in accordance with the invention.

5 ~~Preferably~~ Preferably, the sharpener ~~will have~~ has a container that ~~can be used to catch~~ for catching shavings that are ~~cast off~~ produced during sharpening. Such a container can be configured as a collection cap or a shaving ~~capsule~~ capture container which ~~is connects~~ essentially adjacent to the blade and is made to be transparent.

10 ~~Preferably~~ Preferably, the ~~feed guide~~ disk ~~will be~~ is guided between to ~~plane-planar~~ surfaces, which prevent movement of the ~~feed guide~~ disk in an axial direction, i.e. perpendicular to the flat ~~plane-planar~~ surface.

~~Preferably~~, there ~~will be an opening in the~~ exterior wall of the housing has an opening through which a pencil can be inserted into the housing for sharpening, and which is covered at least partially by a covering that is, in particular, formed as a disk.

15 This covering will be spring-loaded against the housing from the interior side of the housing. The covering will have ~~an opening a~~ passage through which the pencil and, if necessary, a part of the ~~feed guide~~ device for this pencil will ~~reach~~ extend. The ~~opening passage~~ is thereby designed in such a manner that the holding device or the pencil rests on the surrounding wall of the opening. The housing is thereby, essentially covered in

20 the area of the opening through which the pencil is inserted for sharpening and in which it is moved perpendicular to its length axis upon sharpening, ~~essentially covered~~. The covering is thereby arranged perpendicular to the length axis of the pencil and opposite

movable relative to the housing ~~so it can move~~ and is pressed against the housing using a spring in each of the resulting possible relative positions ~~opposite~~ with respect to the housing.

The sharpener is preferably made, at least in part, of a high-grade synthetic material, such as POM. In particular, the ~~feed~~ guide track and/or the holding device and/or the ~~feed~~ pencilguide pin and/or the container are made from a (high-grade) synthetic material.

The cutting device, or the blade, is preferably made from hardened steel. In particular it is planned that the holding device contains the ~~feed~~ easingguide sleeve.
Especially ~~preferred~~ preferably, ~~is~~ the holding device ~~is~~ of the rotating ~~compartment~~ insert, or the reverse vice versa.

In a preferred formation, the sharpener has a rotating ~~compartment~~ insert that has a ~~feed~~ easingguide sleeve with a circumferentially extending wall section ~~reaching in the perimeter direction~~. This wall section limits an empty space in which the pencil can be received upon sharpening, in particular ~~relevant to its shape~~ form fittingly. In this preferred formation the rotating ~~compartment~~ insert has another support section over which this rotating ~~compartment~~ insert can be supported in an axial direction.

Preferably the support section is formed in such a way that it ~~runs~~ extends in a radial direction.

It is preferable that the ~~feed~~ easingguide sleeve ~~has~~ have a varying wall thickness in the ~~perimeter~~ circumferential direction. It is especially preferred that the wall thickness of the ~~feed~~ easingguide sleeve is essentially constant in an axial direction.

The path of the wall thickness of the ~~feed casing~~guide sleeve in the perimeter direction will preferably influence the shape of the pencil to be sharpened.

It is especially preferable that the support section is arranged ~~to~~at the axial end of the ~~feed casing~~guide sleeve. The support section is preferably supported on a housing section and in particular in an axial direction. Preferably the support section is supported in an axial direction on a housing wall section that essentially runs in a radial direction.

Preferably there is a housing ~~compartment~~insert that is made of multiple parts, for example, a ~~two-part housing~~two-parts. The housing ~~compartment~~insert can be formed in such a way that it has a ~~separating level~~dividing plane that is essentially arranged perpendicular to the ~~length~~longitudinal axis. In a preferred formation embodiment, there are at least three cam ~~feed~~guide surfaces arranged on or in the housing ~~compartment~~insert.

In ~~particular~~particular, there can be a ~~two-part housing~~compartment insert with two parts and at least one cam ~~can be~~ arranged on each of these ~~parts~~part on the side facing the housing interior.

It is further preferred that the housing ~~compartment~~insert has a wall section ~~in~~at both axial ends which respectively extends ~~direction on both sides and one~~ running in a radial direction ~~that~~and is equipped with an opening. The ~~feed casing~~guide sleeve can run through this opening. ~~In an especially preferred configuration,~~ Preferably, at least one limitation wall of this opening will work as a cam ~~feed~~guide surface.

It is especially preferred that there ~~will be~~ three cams ~~that~~ which are situated next to each ~~other~~ one another in an axial direction.

~~Preferably~~ Preferably, at least one of the ~~cam~~ scam or a cam seat ~~set~~ will ~~have~~ has an opening ~~that functions,~~ which is, for example, a through passage and radially
5 inwardly extends ~~as an input/output opening and runs radial within itself~~ in an axial direction. The ~~feed-easing~~ guide sleeve can be inserted through this opening. This opening is preferably formed in such a way that the ~~feed-easing~~ guide sleeve can be received in a form-fitting manner, in particular in a rotationally fixed manner.

It is preferred that at least three cams are connected with each other as one
10 piece.

It is further especially preferred that at least three cams are connected in one piece with the ~~feed-easing~~ guide sleeve.

~~Preferably this~~ the housing is ~~insulated,~~ sealed, particularly on the end. One or more seals can be used for this purpose.

15 In a preferred ~~formation,~~ embodiment, there are at least two cam feeds guides arranged at an angle of 120° to each ~~other~~ one another.

It is further preferred that at least two cam ~~feeds~~ guides are arranged at an angle of 60° to each ~~other~~ one another. Preferably, the cam ~~feeds~~ guides are planar, ~~can also be arranged whereby~~ at least two cam ~~feeds~~ guides are used whose perpendiculars
20 ~~defaults have~~ enclose an angle of 120° .

BRIEF DESCRIPTION OF THE DRAWINGS

In the ~~following~~ following, the invention is described in greater detail using the figures that are not intended to limit the invention.

5 The figures illustrate the following:

Fig. 1 ~~is a first example of a configuration~~ exemplary embodiment of the invention in a schematically, partially cut view;

Fig. 2 is a first cutaway view of the ~~display~~ illustration in Fig. 1;

Fig. 3 is a second cutaway view of the illustration ~~display~~ in Fig. 1;

10 Fig. 4 illustrates the position of the knife blade in a first positioning position of the pencil;

Fig. 5 illustrates the position of the knife blade in a second positioning position of the pencil;

15 Fig. 6 illustrates the position of the knife blade in a third positioning position of the pencil;

Fig. 7 illustrates the position of the knife blade in a fourth positioning position of the pencil;

Fig. 8 ~~is a second example~~ exemplary embodiment ~~configuration~~ of the invention in a schematic, partial cutaway view;

20 Fig. 9 is a cutaway view along the line 9-9 ~~from~~ in Fig. 8;

Fig. 10 is a side view from the direction of the arrow 126 ~~from~~ in Fig. 8;

and

Fig. 11 is a cutaway view along the line 11-11 ~~from~~ in Fig. 10;

Fig. 12 ~~is an example configuration~~exemplary embodiment of the invention
in schematic ~~display~~illustration;

Fig. 13 ~~is a cutaway view from the view of~~as viewed from line 13-13 in
Fig. 12;

5 Fig. 14 ~~is a cutaway view from the view of~~as viewed from line 14-14 in
Fig. 12;

Fig. 15 ~~is a cutaway view from the view of~~as viewed from line 15-15 in
Fig. 12;

10 Fig. 16 ~~is a cutaway view from the view of~~as viewed from line 16-16 in
Fig. 12;

Fig. 17 ~~is a cutaway view from the view of~~as viewed from line 17-17 in
Fig. 12;

Fig. 18 ~~is an example configuration~~exemplary embodiment of the invention
in schematic ~~display~~illustration;

15 Fig. 19 ~~is a cutaway view from the view of~~as viewed from line 19-19 in
Fig. 18;

Fig. 20 ~~is a cutaway view from the view of~~as viewed from line 20-20 in
Fig. 18;

20 Fig. 21 ~~is a cutaway view from the view of~~as viewed from line 21-21 in
Fig. 18;

Fig. 22 ~~is a cutaway view from the view of~~as viewed from line 22-22 in
Fig. 18;

Fig. 23 ~~is an example configuration~~exemplary embodiment of the invention
in schematic ~~display~~illustration;

Fig. 24 ~~is a cutaway view from the view of~~ as viewed from line 24-24 in
Fig. 23;

5 Fig. 25 ~~is a cutaway view from the view of~~ as viewed from line 25-25 in
Fig. 23;

Fig. 26 ~~is a cutaway view from the view of~~ as viewed from line 26-26 in
Fig. 23;

10 Fig. 27 ~~is a cutaway view from the view of~~ as viewed from line 27-27 in
Fig. 23;

Fig. 28 ~~is an example configuration~~exemplary illustration of the invention
in schematic ~~display~~illustration;

Fig. 29 ~~is a cutaway view from the view of~~ as viewed from line 29-29 in
Fig. 28;

15 Fig. 30 ~~is a cutaway view from the view of~~ as viewed from line 30-30 in
Fig. 28;

Fig. 31 ~~is a cutaway view from the view of~~ as viewed from line 31-31 in
Fig. 28;

20 Fig. 32 ~~is a cutaway view from the view of~~ as viewed from line 32-32 in
Fig. 28;

Fig. 33 ~~is an example configuration~~exemplary embodiment of the invention
in schematic ~~display~~illustration ~~with in~~ partial cutaway view; and

Fig. 34 ~~is an example configuration~~exemplary embodiment of the invention in schematic ~~display illustration~~with in partial cutaway viewview.

DETAILED DESCRIPTION

5 Figure 1 shows an ~~example configuration~~exemplary embodiment of the sharpener 1 in accordance with~~described~~ in the invention that is designed to sharpen essentially elliptical cosmetic pencils with an essentially chisel-shaped point.

 The sharpener has a housing, which in its entirety has been designated with the reference number 10. The housing has an essentially cylindrical section 10a that is
10 partially covered by ~~a ring~~an annular plate 10b.

 An essentially cone-shaped tapering 10c has been shaped onto this ~~ring~~annular plate 10b, upon which the knife blade 12 made of hardened steel has been fastened using a screw 11.

 The knife blade has been formed in a conventional manner, i.e. it has been
15 configured as an essentially flat plate ~~that has a blade edge 12b and a point 12c (Fig. 4)~~on the turned surface of the blade, which on the surface directed towards the cutting side has a blade edge 12b and a point 12c (Fig. 4).

 The inner cylindrical space 10d of the housing 10 is closed with a housing lid 13 that is essentially ~~shaped in a circular fashion~~of annular shape and fastened with
20 ~~screws 13a onto the housing 10 that screwed into~~with screws 13a that engage screw taps 10e in the housing 10.

~~Please not~~It is noted that instead of this screw fastening, a ~~another~~connection between the housing lid and the housing can be used.

A holding device is arranged within the housing, which in its entirety is designated with the number 14.

The holding device 14 consists of a first tube-shaped holding part 14a adapted to the contour of the pencil to be sharpened and an essentially disk-shaped part 14b that are preferably connected together as one part. 14b, which are preferably connected together in one piece.

The holding device 14 is received in the cylindrical hollow space 10a of the housing 10 in such a way that the holding device can be rotated ~~opposite~~ relative to the housing.

For this ~~purpose~~ purpose, the housing lid 10 is equipped with a drill-hole 13b that is formed in such a way that it enables an undisturbed ~~rotation~~ rotational movement of the tube-shaped attachment 14a.

As already ~~executed~~, mentioned, the tube-shaped attachment 14a is formed in such a way that at least the inner contour is adapted to the outer contour of a pencil 16 with a length axis 18.

The disk-shaped part 14b of the holding device has a first end wall 22 and a second end wall 24. There is a first groove 26 in the first end wall and a second groove 28 in the second end wall 24. A first ~~pencil-pin~~ pin 30 held firmly in the housing 10 reaches into the groove 26 ~~that is held firmly in the housing 10~~ and a ~~pencil-pin~~ pin 32 held firmly in the housing lid 13 reaches into the second groove 28 ~~that is held firmly in the housing lid 13~~.

The dimensions of the first and second ~~groove~~ grooves 26, 28 and of the first ~~30~~ and second ~~pencil~~ pins 30, 32 have been chosen in such a way that the pencils pins can slide into the grooves.

5 There is also a sealing ~~ring~~ disk 34, which preferably is made of synthetic material and is placed between the disk-shaped part 14b and the lid 13. This groove serves only for purposes of ~~insulation~~ sealing and also ~~makes~~ facilitates movement of the ~~circular-shaped~~ annular part 14b ~~easier~~.

10 As can be clearly seen in Fig. 1, an essentially conical, cup-shaped container 36 is placed on the disk-shaped attachment 10b, which is set upon an attachment 10g of the circular part 10b. This container preferably consists of synthetic material, ~~and it is especially preferred that this synthetic material is transparent.~~ preferably of transparent plastic.

Fig. 2 shows a partial cutaway view along line 2-2 in Fig. 1. Here the shape of the groove 28 can be seen clearly.

15 Fig. 3 shows another cutaway ~~display~~ illustration from which the shape of the groove 26 ~~appears~~ is apparent. The shape of the groove or grooves is determined in particular by a reverse calculation from the desired ~~shift~~ rolling movement ~~when~~ during sharpening.

20 As can be seen in Fig. 3, the first groove 26 is ~~formed in an~~ essentially ~~elliptical manner~~ elliptically shaped whereby the elliptical ~~formation~~ shape essentially corresponds to the elliptical shape to the corresponding opening of the tube-shaped

attachment 14a of the holding device. In other words, the curve track 26 is essentially ~~elliptical and concentric~~ elliptically concentric to the elliptical contour of the pencil 16.

As can be seen in Fig. 2, the second groove is also essentially ~~shaped in an approximate elliptical manner,~~ approximately elliptically shaped, but the ellipse here is,
5 roughly stated, tipped at an angle of 45°. One could also call it a distorted ellipse.

The function of the sharpener described in the invention is now described in reference to Figures 4 ~~thru~~ through 7:

~~Because the circular~~ Since the annular attachment 14b of the holding device 14 is held between the disk-shaped attachment 10b of the housing and the housing lid 13,
10 it cannot move in a direction along the axis 18 of the pencil. With respect to the housing 10, the ~~disk-shaped~~ annular attachment 14b thereby executes a ~~flat~~ planar movement. The movement of a body may be presented familiarly as the sum of a translation movement with a rotation movement ~~around~~ about the respective rotating axis in question. A ~~flat~~ planar movement, as in the preceding instance, thereby yields three degrees of freedom,
15 specifically two movement possibilities in the X and Y planes (which is not displayed and which would run perpendicular to the axis 18 in this instance) and a rotation movement.

Because both ~~feed-pencil~~ guide pins 30 and 32 are anchored firmly in the housing and both ~~feed-guide~~ grooves 26 and 28 on the other ~~had~~ hand are arranged firmly
20 in the ~~circular~~ annular attachment 14b, there are two fixed points for the movement of the disk-shaped part 14b in reference to the housing 10 so that only one degree of freedom remains.

This means that a rotation of the pencil 16 leads to an exact pre-determined movement of the holding device 14 in reference to the housing 10 and thereby in reference to the knife blade 12 that is connected firmly to the housing.

Figures 4 ~~thru~~through 7 illustrate ~~how this movement is formed~~the shape of
5 this movement.

The knife 12 is arranged in such a way that it lies at a free angle 40 ~~on~~
against the point of the pencil to be sharpened. When the pencil 16 is rotated, it is
moved, as shown in Fig. 4 ~~thru~~through 7, in such a way up and down along the arrow
direction 50 and back and forth along the arrow direction 52 so that this free angle is
10 maintained in all positions of the pencil.

First, this achieves the exact predetermined shape of the point of the pencil,
a chisel-shaped point in the ~~preceeding~~present case.

~~Second, maintaining the constant free angle results in a situation where the~~
~~cutting result is even and pressure is not placed in a direction vertical to the pencil (seen~~
15 ~~in the direction of the display in Fig. 4 thru 7) during the cutting process. it is achieved~~
with the always constant free angle that the cutting result is even and that pressure is not
exerted in a direction vertical to the pencil (seen in the direction of the illustration in
Figs. 4 through 7) during the cutting process.

This brings about an exact forced guidance of the position of the pencil in
20 relation to the knife blade in a technically simple manner.

~~Note~~It is pointed out that the chisel-shaped point on an elliptical pencil is
the preferred application of this invention. The solution ~~described in~~in accordance with

the invention makes it possible, however, to realize the greatest number of different shapes that can be made through the linear ~~stratification~~overlaying of two curved surfaces ~~to~~with two fixed points, which are the ~~pencils~~pins.

Fig. 8 shows a second ~~example configuration~~exemplary embodiment of the invention in a schematic ~~display~~illustration.

The sharpener 1 has a housing 10 upon which a detachable lid 60 is fastened. The housing 10 has a thin exterior wall 62. Within the thin exterior wall 62, a first intermediate part 64 and a second intermediate part 66 are arranged within the housing 10.

The first 64 and the second intermediate part 66 each ~~has~~have an essentially ~~flat area~~planar region 68, 70 which essentially runs perpendicular to the length axis 72 of a channel 74 that is arranged within the holding device and serves to receive a pencil 16 to be sharpened.

The first 64 and the second intermediate part 66 are positioned in a rotationally fixed manner in the housing in relation to the length axis 72. The first ~~42~~64 and the second intermediate part 66 each have a flange 76, 78 which ~~runs~~extends in the ~~exterior area~~outer region 80, 82 of a plate 80, 86 ~~containing the flat area~~representing the planar area 68 or 70 perpendicular to the ~~flat~~planar area 60, 70. ~~With their respective exterior upper surfaces 88, 90 turned away from the length axis 72, the surrounding~~
The surrounding flanges 76, 78 engage the exterior wall 62 with their respective exterior upper surfaces 88, 90 turned away from the length axis 72. The end wall 92 turned away from the plate 86 of the second intermediate

part 96 is supported against the first intermediate part 64. The plate 84 of the first intermediate part 64 and the plate 86 of the second intermediate part 66 each have an essentially circular opening 94, 96. ~~In the area of the opening 94 of the first intermediate part 96, an attachment 98 with a cylindrical part 100 runs from the plate 84 in the~~
5 ~~direction away from the second intermediate part 66, as well as a conical part 102 formed onto it;~~ An attachment 98 with a cylindrical part 100 and a conical part 102 formed onto it, extends in the area of the opening 94 of the first intermediate part 96 from the plate 84 in the direction away from the second intermediate part 66, whereby the cylindrical part 100 and the conical part 102 are each configured to be hollow.

10 On the end turned away from the second intermediate part 66, the conical part 102 has an opening 104, which connects the interior of the conical part 102 with the interior of the lid 60. A knife blade 12 is mounted on the attachment 98 ~~using a screw 11~~ at an angle to the length axis using a screw 11.

~~There is a~~ A cam 20 ~~that runs~~ extends parallel to the flat areas 60, 66 ~~70~~
15 between the first intermediate part 64 and the second intermediate part 66, ~~which and~~ and makes contact with the first 64 and the second intermediate part 66 and is arranged ~~in a rotating manner in relation to~~ for rotation about the length axis 72 ~~opposite relative to the~~
first intermediate part 64 and the second intermediate part 66. The cam 20 ~~has~~ orbiting on its two end walls 22, 24 respectively has endless grooves 26, 28, ~~on both of its end~~
20 ~~walls 22, 24, that make contact with the first intermediate part 64 and~~ or the second intermediate part 66, and which are asymmetrically arranged positioned in relation to a plane that stretches through defined by the cam 20. ~~Respective pencils run through these~~

grooves 26, 28, which are fastened on the first intermediate part 64 and the second intermediate part 66 so that the movement plane, which the cam 20 can execute opposite the first intermediate part 64 and the second intermediate part 66 through synchronous operation of the pencil with the grooves 26, 28, is determined. Pins which are fastened
5 on the first intermediate part 64 and the second intermediate part 66 respectively run in these grooves 26,28, so that the movement track, which the cam 20 can execute relative to the first intermediate part 64 and the second intermediate part 66 is determined by interaction of the pins with the grooves 26, 28. The cam 20 has an opening a through going passage 106. A tube-shaped attachment 14a is formed onto the cam 20 around this
10 opening through going passage on the side turned directed away from the first intermediate part 64, which runs and extends through the opening 96 of the plate 86 of the second intermediate part 66.

~~The plate 86 of the second intermediate part 66 also has a flange 108 running perpendicular to the flat area 68 further on its side turned away from the first~~
15 ~~intermediate part 64, which is formed in an orbiting manner and serves to support the spring element 110,~~ The plate 86 of the second intermediate part 66 on its side turned away from the first intermediate part 64 further has a flange 108 extending perpendicular to the flat area 68, which is especially endless and serves to support a spring element 110,
which is formed in particular as a spiral spring and supports itself against the second
20 intermediate part 66. ~~The field element 112 supports itself on the second end 112 against a disk 114 with an orbiting flange 116.~~ The spring element 110 is supported at the second end 112 against a disk 114 with an endless flange 116.

~~This disk 114 has an adapted opening 118 on the exterior contour of the tube shaped attachment 14a through which this tube shaped attachment runs.~~ This disk 114 has a through going opening 118 adapted to the exterior contour of the tube-shaped attachment 14a through which this tube-shaped attachment 14a extends.

5 The disk 114 ~~runs~~ extends essentially perpendicular to the length axis 72 and ~~supports itself against~~ is supported on the housing 10 ~~using~~ at its end wall ~~turned~~ directed away from the ~~field-spring~~ element 110. For this purpose, the housing 10 in particular has a tube-shaped attachment 122 that surrounds the length axis ~~22-72~~. The disk in this way covers an opening 124 that ~~runs in~~ extends through the exterior wall 62
10 of the housing 10 and has an opening surface that is larger ~~that~~ than the surface defined by the exterior perimeter of the tube-shaped attachment 14a.

Fig. 9 shows a cutaway display along line 9-9 ~~from in~~ Fig. 8.

Fig. 10 shows a side view from the direction of the arrow 126 ~~from in~~ Fig. 8.

15 Fig. 10 in particular illustrates that the disk 114 ~~is arranged in the direction perpendicular to the length axis 72 in a moveable manner opposite in the direction perpendicular to the length axis 72~~ is moveably arranged relative to the housing 10 and the tube-shaped attachment 122 of the housing 10. The respective position of the disk 114 ~~opposite~~ relative to the housing 10 is specifically determined by the respective
20 relative position of the pencil 16 ~~and or~~ the tube-shaped attachment ~~and/or or~~ the cam 20 relative to the housing 10. The disk 114 ~~pressed~~ biased by the ~~working action~~ of the ~~field spring~~ element 110 against the housing 10 follows the plane perpendicular to the length

axis 72, in particular the movement of the tube-shaped attachment 14a, ~~because~~ since it is ~~positioned~~ rests with its opening outward ~~toward~~ against the outside of the tube-shaped attachment. The ~~field~~ spring element 110 prevents the disk 114 from ~~falling~~ separating from the housing 10 and on the other side ~~hand~~ enables a flexible movability of the disk 114 corresponding to the movability of the tube-shaped attachment 14a.

Fig. 11 shows a cutaway view along the line 11-11 ~~from~~ in Fig. 10.

Fig. 12 shows an ~~example configuration~~ exemplary embodiment of a sharpener described in the invention.

The sharpener 100 has a cap 102, a housing ~~103~~ 103, a housing ~~compartment~~ insert 108 and a ~~rotation compartment~~ rotatable insert 110.

A pencil 116 is also displayed in Fig. 12 ~~with~~ having a length axis 118 that ~~runs and extending~~ into the sharpener 100. This pencil 116 is not a component of the sharpener 100 itself.

The housing 103 is ~~configured in~~ made of multiple parts and has a first housing part 104 and a second housing part 106.

The first housing part 104 is inserted into the second housing part 106 and is supported by the exterior ~~top~~ surface 200 of its first wall section 202 on the interior ~~top~~ surface 204 of the second housing part 106.

~~There is a second cam feed 122b on the interior top surface 206 of the first wall section 202 that runs within in radial direction that can work together with a second cam 120b.~~ A second cam guide 122b is provided on the radially inwardly directed inner surface 206 of the first wall section 202 which can interact with a second cam 120b.

~~In a radial direction within the first wall section 202, a second wall section 208 has been arranged upon whose interior top surface 210 that lies within in a radial direction there is a first cam feed 122a that can work together with a first cam 120a. A second wall section 208 is provided radially inward from the first wall section 202, and~~
5 has on its radially inwardly directed inner surface 210 a first cam guide 122a that can interact with a first cam 120a.

The first 202 and the second wall sectionsections 208 are connected via a third wall section 212 of the first housing part 104 ~~that runs essentially inside in a radial direction, which extends essentially radially inward,~~ has a ledge 214 upon which a cap
10 102 can rest, and ~~has an opening 218 at its end 216 positioned within in a radial direction.~~at its radially inner end 216 has an opening 218.

~~Against the third wall section 212 there is a one piece fourth wall section 220 that is essentially in the area of the opening 218, which tapers in the direction away from this third wall section 212 and the point 222 of the pencil 116 is received in its interior space 221 for sharpening. A fourth wall section 220 is formed in one piece with~~
15 the third wall section 212 essentially in the area of the opening 218, tapers in the direction away from the third wall section 212 and receives the point 222 of the pencil 116 in its interior space 221 for sharpening.

A detachable knife blade 112 which is detachably fastened on to the fourth
20 wall section 220 using a screw 111 ~~runs~~ extends through a – preferably slit-shaped – opening ~~of in~~ in the fourth wall section 220.

The second housing part 106 is ~~formed essentially~~ bowl shaped ~~in the shape of a bowl~~ and has a housing casing 160, that is preferably a wall area that is formed in an essentially elliptical shape, as well as a side cover wall 224 that is ~~shaped~~ formed in one piece with ~~to the housing casing as one part and runs~~ extends essentially ~~within in a radial direction~~ radially inwardly. This cover wall 224 has an opening 226 through which the pencil 116 can be inserted into the interior of the housing 228.

A fifth 230 and a sixth wall section 232 ~~run~~ extend from this cover wall 224 in the area ~~vicinity~~ of the opening 226 in to into the housing interior 228, whose radially inward inner interior top surfaces 234, 236 that ~~lie inside in a radial direction~~ run extend essentially parallel to the length axis 118 of the ~~feed casing guide sleeve~~ 114.

The eighth cam ~~feed guide~~ 122h is arranged on the ~~interior top inner~~ surface 234, which ~~works together~~ cooperates with the eighth cam 120h.

The seventh cam ~~feed guide~~ 122g is arranged on the ~~interior top inner~~ surface 236, which ~~works together~~ cooperates with the eighth cam 120g.

The housing ~~compartment insert~~ 108 that can basically be formed as in one piece or as multiple pieces parts is formed in two ~~pieces parts~~ in the ~~formation~~ embodiment illustrated in Fig. 8 and is fitted ~~using light pressure~~ into the housing 103 using a light pressure fit. The separating ~~level plane~~ of both parts of this housing ~~compartment insert~~ 108 ~~runs~~ extends essentially through a central length axis 119 of the housing 103 whereby these parts of the housing ~~compartment insert~~ 108 are essentially arranged symmetrical ~~in a mirror image symmetrical to this the separating level plane~~.

Both parts of the housing compartment insert 108 are supported against each other in the direction of the perimeter on one another in circumferential direction.

Both parts of the housing compartment 108 can, according to how they are set opposite each other, basically form an essentially closed case surface or an unclosed, at least not completely closed, case surface. Both parts of the housing insert 108 can, accordingly assembled, basically form an essentially continuous mantle surface or a non-continuous, at least not completely continuous mantle surface.

In the configuration shown in Fig. 12, both parts of the housing compartment 108, according to how they are set opposite each other form an essentially unclosed or not completely closed case surface. This is realized in the configuration shown in Fig. 12 in such a way that both parts of the housing compartment each have an essentially closed combined wall section that forms a case section that is configured to be free of openings, which runs essentially parallel to the length axis 118 of the housing compartment 108 and over a part section in the perimeter direction. Flap-like extensions are connected to this combined and breach free case section of both parts of the housing compartment, which run in the perimeter direction. In the embodiment shown in Fig. 12, the two parts of the housing insert 108, accordingly assembled form an essentially unclosed or not completely closed mantle surface. This is realized in the embodiment shown in Fig. 12 in such a way that both parts of the housing insert each have an essentially closed continuous wall section that forms an uninterrupted mantle portion, which in circumferential direction extends essentially parallel to the length axis 118 of the housing insert 108 and over a partial section in the circumferential direction. Flap-like

extensions are connected to this continuous and breach-free mantle portion of the two parts of the housing insert, which extend in circumferential direction.

~~The case surface of the housing compartment 108 runs in the area of these flap-like extensions in the direction of the length axis of this housing compartment 108~~
5 ~~not over the entire length of this compartment 108. The flaps of the different parts of the housing compartment 108 are supported against each other in the perimeter direction. In the area of these flaps of the different parts of the housing compartment, the exterior perimeter measurement is formed in comparison to the interior perimeter measurement of the housing casing 160 in such a way that inserting the housing compartment 108 into the~~
10 ~~housing 103 generates a light pressure fitting. In the area of these flap-like extensions the mantle surface of the housing insert 108 extends in longitudinal axial direction of the housing insert 108 – does not extend over the entire length of the insert 108. The flaps of the different parts of the housing insert 108 support one another in circumferential direction. In the area of these flaps of the different parts of the housing insert, the outer~~
15 ~~diameter is selected compared to the inner diameter of the housing casing 160 such that a light pressure fit is generated upon insertion of the housing insert 108 into the housing 103.~~

~~The housing compartment-insert 108 has a third cam feed-guide 122c that works together with a third cam 120c, a fourth cam feed-guide 122d that works together~~
20 ~~with a fourth cam 120d, a fifth cam feed-guide 122e that works together with a fifth cam 120e, and a sixth cam feed-guide 122f that works together with a sixth cam 120f.~~

The ~~rotation compartment rotatable insert~~ 110 also has a ~~feed casing guide sleeve~~ 114 with a non-rotational symmetrical elliptical ~~ease-like mantle-like~~ wall area 238 that is connected in one piece to the third 120c, fourth 120d, fifth 120e and sixth 120f ~~cam to form one piece~~ cams.

5 The cams 120a, 120b, 120c, 120d, 120e, 120f, 120g, 120h, have been arranged on the exterior ~~top~~ surface of this ~~rotation compartment rotatable insert~~ 110.

 The first 120a and the eighth cam 120h are each formed from a section of the radially outwardly located exterior ~~top~~ surface 240 of the ~~ease-like mantle-like~~ wall area 238 of the ~~feed casing guide sleeve~~ 114 ~~that is positioned outside in a radial~~
10 ~~direction.~~ Furthermore, ~~The the~~ disk-shaped cams 120b, 120c, 120d, 120e, 120f, 120g ~~run extend~~ in a radial direction from this exterior ~~top~~ surface 240 of the ~~ease-like mantle-like~~ wall section 238, which if necessary have gaps 123 – as indicated by the reference symbols. The thickness of these disks is preferably between 1 mm and 10 mm and is especially preferred to be essentially 3mm. But other measurements can be used.

15 The first 120a, ~~the second~~ 120b, ~~the third~~ 120c and ~~the fourth~~ ~~cam~~ cams 120d are arranged into a first group 242 and the fourth 120e, ~~the fifth~~ 120f, ~~the sixth~~ 120g and ~~the seventh~~ ~~cam~~ cams 120h are arranged into a second group 244.

 The cams 120a, 120b, 120c, 120d of the first group 242 are arranged arranged, in this sequence ~~are placed in an axial direction and neighboring each other~~
20 sequence, axially offset and adjacent to one another, whereby - in the ~~configuration as~~ embodiment illustrated in Fig. 12 – two ~~respective~~ respectively neighboring cams 120a,

120b, 120c, 120d ~~are arranged essentially against each other with~~ of the cams 120a, 120b, 120c, 120d of the first group 242 essentially engage one another in an axial direction.

The cams 120e, 120f, 120g, 120h of the second group 244 are arranged arranged, in this sequence ~~are placed in an axial direction and neighboring each other~~ sequence, axially offset and adjacent to one another, whereby - in the configuration as embodiment illustrated in Fig. 12 – two respective neighboring cams 120e, 120f, 120g, 120h ~~are arranged essentially against each other with~~ of the cams 120e, 120f, 120g, 120h of the ~~first~~ second group 244 essentially engage one another in an axial direction.

The first group 242 is ~~arranged~~ spaced in an axial direction at a distance from the second group 244.

The first group 242 is arranged essentially ~~arranged~~ in the end area region 246 of the ~~feed casing guide sleeve~~ 114 that is ~~turned~~ directed toward the fourth wall section 220 of the first housing part 104, whereas the second group 244 is arranged essentially ~~arranged~~ in the end area region 248 of the ~~feed casing guide sleeve~~ 114 ~~turned~~ way-directed away from the fourth wall section 220 of the first housing part 104.

The cams 120a, 120b, 120c, 120d of the first group 242 ~~work together~~ interact with the cam ~~feeds guides~~ assigned to them 122a, 122b, 122c, 122d associated therewith in such a way that ~~for each the position of the rotation compartment rotatable insert 110 in the perimeter direction at each rotation angle is defined in an essentially~~ unique and repeatable manner. is defined in an essentially unique and repeatable manner in circumferential direction and at each rotation angle.

~~In a corresponding manner, the cams 120e, 120f, 120g, 120h of the second group work together with the cam feeds 122e, 122f, 122g, 122h assigned to them. The~~
cams 120e, 120f, 120g, 120h of the second group interact in a corresponding manner with
the cam guides 122e, 122f, 122g, 122h associated therewith.

5 ~~Please note~~ It is noted that instead of the two groups 242, 244 there can also
be only one group or more than two groups. In addition, the number of cams assigned to
a group can be selected differently in order to determine a position ~~at each rotation angle~~
of the ~~rotation compartment~~ rotatable insert 110 at each rotation angle in an essentially
unique manner. For example, three cams can be equipped with ~~corresponding~~
10 correspondingly assigned cam feedsguides. It is also preferable that neighboring cams of
a group are separated – at least partially – ~~are separated against each other with a gap in~~
~~an axial direction~~ from one another by an axial gap. Furthermore, the sequence of the
cams in an axial direction can be arranged differently.

15 In a preferred ~~configuration~~ embodiment the cams assigned to the same
group 242, 244 differ ~~can vary in their size~~.

 Preferably, the cams 120a, 120b, 120c, 120d assigned to the first group 242
are arranged in a mirror symmetrical manner to the cams 120e, 120f, 120g, 120h assigned
to the second group 244 and with respect to a plane of symmetry level that is arranged
perpendicular to the length axis of the ~~rotation compartment~~ rotatable insert 110. If
20 necessary, the entire ~~rotation compartment~~ rotatable insert 110 is formed in a mirror
symmetrical manner with respect to this plane of symmetry level.

The interior contour of the ~~feed casing~~guide sleeve 114 is ~~non-rotational~~
~~symmetrical and rotation symmetrical~~, especially elliptical, ~~elliptical~~ and preferably
adapted to the exterior contour of the pencil 116 that has an elliptical cross-section
surface perpendicular to its length axis.

5 The cap 102 can be detachably connected ~~in a detachable manner with to~~
the first housing part 104. The configuration of the cap 102 is cylindrical in this
application example. The cap 102 can be configured closed ~~so that it closes~~ – turned
away from the housing – ~~and catches to catch~~ shavings that are cast off during
sharpening.

10 Fig. 13 shows the sharpener 100 as viewed from the line 13-13 in Fig. 12.

Fig. 13 illustrates the elliptical configuration of the housing casing 160,
which ~~limits~~ defines an elliptical interior space 106a. Furthermore, Fig. 13 shows the
cylindrical configuration of the cap 102. The knife blade 112 that ~~runs~~ extends through
the slit 112b provided in the fourth wall section 220 ~~in the interior space, which is~~
15 ~~fastened to the fourth wall section 220 in a detachable manner by means of a screw 11, as~~
~~a cutting edge 112a. into the interior space, and is detachably fastened to the fourth wall~~
section 220 by means of a screw 11, has a cutting edge 112a.

Fig. 13 further illustrates the elliptical configuration of the opening cross-
section 104a of the opening 218 facing the second housing part 106 and the circular
20 configuration of the opening cross-section 104b of this opening 218 facing away from the
second housing part 106.

Fig. 14 shows the sharpener 100 as viewed from the view of the line 14-14
in Fig. 12.

The housing ~~compartment~~insert 108 is set into the housing casing 160
using a light pressure fitting, ~~whereby both parts of this housing compartment 108 are~~
5 ~~supported on one another by the flaps 250, 252, 254, 256 running in the perimeter~~
~~direction. fit, whereby the two parts of this housing insert 108 are supported on one~~
another by the circumferentially extending flaps 250, 252, 254, 256.

Fig. 14 also shows the first cam ~~feed~~guide 122a, as well as the second cam
~~feed~~guide 122a. The first ~~feed~~guide surface 258a of the first cam ~~feed~~guide 122a and
10 the second ~~feed~~guide surface 258b of the second cam ~~feed~~guide 122b are ~~formed evenly~~
~~and spaced in an axial direction toward each other and arranged parallel to one another.~~
are respectively shaped planar and are axially offset from and parallel to one another.

~~The first cam 120a makes contact in a minimum of one rotation setting, like~~
~~the first cam feed 122a shown in Fig. 14. Preferably, the first cam 120a will make~~
15 ~~contact with the first cam feed 122a in each rotation position. The first cam 120a contacts~~
in at least one rotational orientation, as shown in Fig. 14, first cam guide 122a in each
rotation.

Fig. 15 shows a view along line 15-15 in Fig. 12.

~~The rotation position of the rotation compartment 110 in Fig. 15~~
20 ~~corresponds to that in Fig. 14. The rotational position of the rotatable insert 110 in Fig. 15~~
corresponds to that shown in Fig. 14.

The cutaway ~~display~~ illustration in Fig. 15 is seen in an axial direction opposite that from Fig. 14.

As can be seen in the ~~areas~~ regions 260 and 262 in Fig. 15, the parts 264, 265 of the housing ~~compartment~~ insert 108 ~~are set in the perimeter direction in the axial position displayed there.~~ are spaced apart in circumferential direction in the axial position
5 displayed there.

The second, elliptically formed cam 120b, ~~lies on~~ engages the second cam ~~feed-guide~~ 122b in at least one ~~rotation~~ rotational position, especially in all ~~rotation~~ rotational positions.

10 The first 120a and the second cam ~~feed-guide~~ 120b are arranged against each other ~~relative to one another~~ in such a way that each of their large axes stand ~~perpendicular to one another.~~ their respective main axis is perpendicular to that of the other.

Furthermore, Fig. 15 shows the third 122c and the fourth cam ~~feed-guide~~ 122d that ~~run~~ which respectively extend from the exterior wall 268 of the housing ~~compartment~~ insert 108 inward as a type of separating wall, and are ~~especially~~ perpendicular to the length axis 118.

The third ~~feed-guide~~ surface 258c of the third cam ~~feed-guide~~ 122c and the fourth ~~feed-guide~~ surface 258d of the fourth cam ~~feed-guide~~ 122d are ~~also configured evenly and in an axial direction to each other and arranged parallel to one another.~~ are also configured planar and axially offset and parallel to one another.
20 also configured planar and axially offset and parallel to one another.

The third 258c and the fourth feed-guide surface 258d are also arranged perpendicular to the first 258a and the second feed-guide surface 258b.

5 The third cam 120c ~~rests on~~ contacts the third cam feed-guide 122c, at least in one ~~rotation~~ rotational position, especially in all ~~rotation~~ rotational positions. The
perimeter circumferential surface of the third cam has two ~~bent areas~~ curved regions that
rest against one another ~~on each other~~ with their respective ends ~~so that two transition~~
~~areas 270, 272 are essentially running between the bent areas.~~ so that two essentially pointy
transition areas 270, 272 are formed between the curved regions. These points 270, 272 lay
opposite each other and are rotated clockwise approximately 45° ~~opposite~~ relative to the
10 large main axis 124a of the first cam 120a ~~similar to a clock hand and approximately 45°~~
~~opposite the large main axis 124d of the second cam 120b similar to an opposite clock~~
~~hand.~~ and counter clockwise approximately 45° relative to the large main axis 124d of the
second cam 120b. The third cam 120c is configured in such a way that the bending
curvature 123a toward the main axis 124b of the second cam 120b is somewhat rounder
15 than the bending curvature 123b ~~that runs~~ extending in the opposite direction.
Furthermore, the third cam 120c ~~in the view level running perpendicular to the length~~
~~axis 118 is point symmetrical.~~ is point symmetrical in the plane of view extending
perpendicular to the length axis 118.

Fig. 16 shows a view along the line 16-16 in Fig. 12.

20 The entire ~~rotation compartment~~ rotatable insert 108 in Fig. 16 is rotated by
90 degrees ~~opposite~~ relative to the position in ~~Fig.~~ Figs. 14 and 15.

~~The fourth cam 120d lies at least on one rotation position, particularly in~~
~~all, on the fourth cam feed 122d. The fourth cam 120d engages on the fourth cam guide~~
~~122d at least in one rotational position, particularly in all. The fourth cam 120d is mirror~~
symmetrical to the third cam 120c in relation to the large main axis 124b of the second
5 cam 120b.

Fig. 17 shows a view along the line 17-17 in Fig. 12.

The third cam 120c is asymmetrical. The sections 125a ~~thru~~ through 125d
of the cam feeds ~~guides~~ 122a ~~thru~~ through 122h facing cams 120a ~~thru~~ through 120h are
essentially configured ~~evenly~~ planar.

10 Through the ~~joint operation~~ interaction of the cams 120a ~~thru~~ through 120d
with the cam feeds ~~guides~~ 122a ~~thru~~ through 122d, the feed ~~easing~~ guide sleeve 114 is
held in each rotational position in such a way that the point of a pencil ~~contained~~ received
in the feed ~~easing~~ guide sleeve 114 is guided along the cutting edge 112a.

~~Here the concepts of~~ The terms left, right, downward and upward ~~can be~~ are
15 understood as follows: Upward and downward direction specifications are understood to
be in the cutting ~~level~~ plane perpendicular to the central ~~length~~ longitudinal axis 119,
~~which also run~~ and extending in a first direction. Left and right direction specifications
are understood to ~~run~~ extend in a second direction perpendicular to the first direction.
The position of the knife blade 112 is ~~defined~~ designated as upward. The first cam feed
20 guide 122a by making contact with the first cam 120a prevents the rotation ~~compartment~~
rotatable insert 110 from moving upward by making contact with the first cam 120a. As
shown in Fig. 15 shows, the second cam 120b, which is located in an axial direction next

to the first cam 120a, presents ~~an~~ a guide upward feed; i.e. it prevents a downward movement of the ~~rotation compartment rotatable insert~~ 110. Fig. 16 ~~shows~~ shows the third cam 120c and its cam ~~feed guide~~ 122c. This prevents leftward movement of the ~~rotation compartment rotatable insert~~ 110 and ensures that the rotatable insert ~~rotation~~
5 ~~compartment~~ 110 is guided to the right. Fig. 17 shows the fourth cam 120d and the fourth cam ~~feed guide~~ 122d which ~~work together~~ cooperate to ~~make enable~~ a guiding to
the right ~~rightward movement across possible~~. ~~Viewed~~ When viewed from the first housing part 104 ~~outward~~, there is a corresponding arrangement of four cams 120a ~~thru to~~
h and ~~for four~~ cam feeds guides 122g and to 122h (two cam feeds guides cannot be seen)
10 at the back portion of the sharpener, which ensure a more even ~~operation operation~~; and, in particular ~~particular~~, jamming is prevented ~~jagged edges~~. The total number of eight cams 120a ~~thru to~~ 122h therefore make it possible for the ~~rotation compartment rotatable~~
insert 110 to move up and down in the ~~arrow direction of arrow~~ 150 upward or downward
upon rotation and left and right in the ~~arrow direction of arrow~~ 152 to the left or right
15 (Fig. 17), so that the pencil ~~in lays~~ rests against the cutting edge ~~in at~~ each rotation angle position. The position of the ~~rotation compartment rotatable insert~~ 110 is determined uniquely by each rotation angle.

~~In a preferred configuration, the rotation compartment 108 with an open housing 103 may only be moved in an axial direction in a limited number of rotation~~
20 ~~positions~~; In a preferred embodiment, the rotatable insert 108 may be axially moved only
in a limited number of rotational positions when the housing 103 is open, in particular ~~upon during~~ assembly. This can, for example, be one or two or three or four or more

~~rotation-rotational~~ positions. For the remaining positions, ~~impacts will work stops~~ act in an axial direction, in ~~particular especially in~~ both orientations of the axial direction.

The ~~impacts stops~~ can, for example, be configured in such a way that cams in an axial direction ~~strike strike, possibly alternately,~~ against neighboring cam feeds
5 ~~guides upon a load under pressure in an axial direction, if necessary, in an alternating manner.~~

Fig. 18 shows an ~~example configuration exemplary embodiment~~ of the invention in a schematic ~~display illustration~~.

The sharpener 100 has a housing 103 with a first housing part 104 and with
10 a second housing part 106.

The second housing part 106 has a first housing wall section 400 and a second housing wall section 402 that is rigidly connected ~~firmly and as in~~ one piece with the first housing wall section 400.

~~The first housing wall section 400 of the second housing part 106 is formed~~
15 ~~in a circular-elliptical manner and runs around a housing length axis 404. The first~~
housing wall section 400 of the second housing part 106 is of annular-elliptical shape and
extends about a housing length axis 404.

The second housing wall section 402 of the second housing part 106 ~~runs~~
extends essentially radially in a radial direction to the housing length axis 404. This
20 second housing wall section 402 is formed as an elliptical plate and has an elliptical opening 406. ~~A circular depression 408 is located on the side of the second housing wall section 402 turned toward the interior of the housing 228 surrounding the opening 406.~~

An especially circular recess 408 extends about the opening 406 on the side of the second housing wall section 402 facing the interior of the housing 228.

~~A disk-shaped sealing element 410 is contained in this depression.~~ An especially disk-shaped sealing element 410 is received in this recess. This sealing element

5 410 has an opening 412. This opening has an elliptical cross-section that is smaller ~~that~~ than the elliptical cross-section of the opening 406 ~~that has been provided in the second housing wall section 402.~~ The ~~exterior-perimeter~~ outer diameter contour of the sealing element 410 can, for example, be circular ~~in configuration whereby the diameter of the circle is smaller that~~ than the diameter of the circular ~~depression~~ recess 408.

10 The first housing part 104 is configured as one piece and connected permanently or detachable with the second housing part 106.

The first housing part 104 has a disk-like area 414 that ~~runs~~ extends essentially perpendicular to the housing length axis 404. This disk-like area ~~413~~ 414 radially outwardly has an ~~exterior-perimeter~~ outer diameter contour ~~running outward in a radial direction that is essentially fitted~~ adapted to the ~~interior-perimeter~~ inner diameter contour of the first housing wall section 400. An opening 416 is provided ~~in a radial direction inside~~ radially inward in the disk-like area 414.

A ~~continuation~~ tab is provided on this disk-like area 414 that runs from this area 414 in the direction away from housing interior space 228 and ~~hold~~ receives the
20 knife blade 112 by means of a screw 111.

Two flanges 510, 512 are further provided in the disk-like area 414 that ~~stands facing inward in front of the radially exterior section of the area 414 in a radial~~

~~direction and protrude from the radially outer portion of the area 414 in axial direction~~
~~and towards the housing interior space 228. The flanges 510, 512 connect outside with~~
~~the disk-like area 414 in a radial direction and are each formed as a circular elliptical~~
~~section and are spaced from each other by a gap 417, 418 in the perimeter direction.~~
5 radially outwardly are flush with the disk-like area 414 and are each formed as an annular
elliptical section and are spaced from one another by a gap 417, 418 in the
circumferential direction.

The first housing part 104 is axially inserted into the second housing part
106 ~~in and axial direction.~~

10 If necessary, a cap or a lid 102 is detachably fastened to the housing 103 to
create a space 420 for the collection of shavings. This cap 102 can, for example, have an
offset 422 in its wall 424 and can be placed, ~~or especially~~ centered, ~~in or on~~ into or onto
the first housing wall section 400 with an area 426 connecting to this offset.

Furthermore, an especially elliptical opening 428 is provided in the disk-
15 like area 414 of the first housing part 104 through which the pencil 16 can reach to the
knife blade 112.

There is a ~~rotation compartment~~ rotatable insert 110 arranged in the
housing interior 228 that has a ~~feed casing or box~~ guide sleeve or bushing 114 and a
support section 430 ~~that runs~~ extending essentially ~~in a radial direction~~ radially to the
20 length axis 404. This support section 430 is configured in such a way that it can absorb
any tipping ~~momentum~~ moments ~~that have an effect on the feed casing around~~ act on the

guide sleeve 114 about an axis, which is aligned perpendicular to the housing longitudinal axis 404.

In the ~~configuration~~ embodiment illustrated in Fig. 18, this support section 430 is configured as a disk with a round ~~exterior-perimeter contour~~ outer diameter shape which is ~~arranged in an axial direction~~ positioned axially at the end of the feed-easing guide sleeve 114 and is connected with it as in one piece. This disk ~~can support itself~~ is supported on the disk-like area 414 of the first housing part 104 and/or on the housing ~~compartment~~ insert 108. The opening provided in this support section 430 corresponds – in particular with respect to the contour – to the opening 432 that is provided in the feed-easing guide sleeve 114.

In the ~~configuration~~ embodiment shown in Fig. 18 there is also a cam arrangement 434 that is configured as a one-piece cam ~~compartment~~ insert 436 with three axially adjacent cams 438, 440, 442 ~~arranged next to each other in a radial direction~~.

This cam ~~compartment~~ insert 436 has an opening 444 that is configured in such a way that the exterior ~~top-surface~~ 446 of the feed-easing guide sleeve 114 can be received in a form-fitting manner and essentially or approximately ~~closed~~ without looseness.

Each of the cams 438, 440, 442 works together with a cam ~~feed~~ guide 448, 450, 452. Accordingly, these cam ~~feeds~~ guides 448, 450, 452, of which cam ~~feed~~ guide 452 is shown in Fig. 16, are offset ~~also set~~ in an axial direction and arranged next to each ~~other~~ one another.

The third cam feed guide 452 is formed by the interior ~~top~~ surface 454 of an opening 456 that is provided in a first wall section 456 of the housing ~~compartment~~ insert 108 that ~~runs~~ extends in a radial direction.

5 ~~There is a second wall section 460 of the housing compartment 108 provided that runs in a radial direction and is at a distance in an axial direction from the wall section 458 that runs in a radial direction. A second, radially extending wall section 460 of the housing insert 108 is provided axially spaced from the first radially extending wall section 458.~~

10 On the first 458 and the ~~section~~ second radially extending wall section 460 that ~~run in a radial direction~~ there is a respective protruding ~~bridge~~ web 462, 464 that is essentially formed straight and elongated. These ~~bridges~~ webs 460, 462 serve as first 448 and a second cam feed guide 450 for the first 438 and second cam 440.

15 On one of the wall sections 458, 460, two flanges or wall sections 492, 494 that ~~run~~ extend in an axial direction and in a perimeter direction have been arranged on the outside in a radial direction, which ~~and circumferential directions are positioned~~ radially outside, are spaced in the perimeter ~~a circumferential~~ direction and are therefore not displayed in the cutaway view of Fig. 18.

20 An opening 466 ~~has been~~ is provided in the second radially extending wall section 460 of the housing ~~compartment~~ insert 108 that ~~runs in a radial direction through~~ which the feed casing guide sleeve 114 ~~run~~ extends.

The first 438 and the second 440 ~~cam-cams~~ are arranged in an axial direction between the first 458 and second radially extending wall section 460 of the housing ~~compartment-insert~~ 108 ~~running in a radial direction~~.

Fig. 19 shows a view along the line 19-19 from Fig. 18 with the lid 102
5 removed.

The first housing wall section 400 of the second housing part 106 can be seen in Fig. 19.

The second housing part 104 is ~~compartment-in~~ inserted into this first housing wall section 400, upon which an extension 480 is provided that ~~houses-receives~~
10 the knife blade 122 by means of a screw 111.

Furthermore, a section of the opening 428 of the first housing part 104 can be seen.

Fig. 20 shows a cutaway view along the line 20-20 from Fig. 18 displayed at a 90° rotation.

Fig. 20 shows the cam ~~compartment-insert~~ 436, which contains the first
15 cam 438 and the second cam 440. The cams 438, 440 are ~~connection~~ firmly rigidly
connected with a ~~easing-sleeve~~ 490 whose top surface forms the third cam 442 ~~on a level~~
offset in an axially offset plane ~~axial direction~~.

Fig. 20 also shows the ~~feed-easing-guide sleeve~~ 114.

20 The cam ~~compartment-insert~~ 436 and the ~~easing~~ or the sleeve 490 of the
cam ~~compartment-insert~~ 436 are arranged around-circumferentially about this ~~feed-easing~~
guide sleeve 114 ~~in a perimeter direction~~ and in a form-fitting manner.

Fig. 20 also shows the first cam ~~feed guide~~ 448 configured as a ~~bridge web~~ 462 and – designated with ~~by~~ cross-hatches – the second cam ~~feed guide~~ 450 configured as a ~~bridge web~~ 464.

Figure 20 also shows two wall sections 492, 494 arranged ~~firmly positioned~~ rigidly on the radial wall section 458 of the housing ~~compartment insert~~ 108 and ~~running~~ in a radial direction on the extending radially outside in a ~~perimeter circumferential~~ direction and axially, as well as an axial direction, between which there are gaps 469, 498 seen in the ~~perimeter circumferential~~ direction.

The respective first 438 and/or second cam 440 can be situated ~~extend~~ into these gaps ~~in the~~ at an appropriate rotation rotational position.

Fig. 21 shows a cutaway view of the ~~configuration in embodiment of~~ Fig. 18 along the line 21-21 displayed at a 90° rotation.

Fig. 22 shows a cutaway view of the ~~configuration in embodiment of~~ Fig. 18 along the line 22-22 displayed at a 90° rotation.

Fig. 22 also ~~displays shows~~ the disk-like area 414 of the flanges 510, 512 on the disk-like area 414 of first housing part 104, which are ~~positioned protrude~~ in an axial direction from the ~~exterior radial section~~ radially outer portion of the area 414 and facing the housing interior space 228. The gaps 416, 418 in the ~~perimeter circumferential~~ direction between these flanges 510, 512 are also displayed.

Fig. 22 also shows the support section 430 –configured here as a disk ~~here~~ – as well as the opening 432 running through this support section 430 ~~and or~~ the feed ~~easing guide sleeve~~ 114.

The opening 428 of the first housing part 104 is designated by the line 514, which in Fig. 22 is partially covered by the support section 430.

~~The position of the support section 430 and the opening 432 are designated by the line 430 and 432, where it is shown when a pencil or the feed casing 114 is rotated during sharpening by 90 degrees opposite the position described previously in Fig. 22.~~
5 Lines 430a and 432a show the position of the support section 430 and the opening 432, when a pencil or the guide sleeve 114 is rotated during sharpening by 90 degrees relative to the position described previously in Fig. 22. As can be seen from ~~this various these~~ different positions of the support section, this support section runs the latter extends
10 temporarily during sharpening – in particular in an alternating manner alternatingly - into the gaps 418, 418-upon sharpening.

Fig. 23 shows an ~~example configuration~~ exemplary embodiment of the invention in a schematic ~~display~~ illustration.

The sharpener 300 shown in Fig. 23 differs from the ~~example configuration~~ exemplary embodiment shown in Fig. 18, in particular ~~through by~~ the configuration of the ~~rotation compartment~~ rotatable insert 110 and the configuration of the cam arrangement 434.

The ~~rotation compartment~~ rotatable insert 110 is connected ~~as in~~ one piece ~~in with~~ the cam arrangement 434 in the ~~example configuration~~ exemplary embodiment shown in Fig. 23. ~~Further~~ Further, the ~~rotation compartment~~ rotatable insert 110 as shown in the ~~configuration~~ embodiment ~~in of~~ Fig. 23 does not have the disk 430 described in Fig. 18 which is arranged in that ~~configuration~~ embodiment between the

housing compartment insert 108 and the disk-like area of the housing compartment insert 104.

In the ~~configuration shown in~~ embodiment according to Fig. 23 there is another sealing device 410 or sealing disk 530 ~~in~~ is provided at the appropriate mentioned position. The sealing devices 410 and 530 are – as seen in an axial direction – arranged positioned on different sides of the housing compartment insert 108. The sealing device or sealing disk 530 radially inwardly has an opening 532 ~~inside in a radial direction~~ through which the feed casing guide sleeve 114 of the rotation compartment ~~runs~~ rotatable insert extends.

The cam arrangement 434 is arranged in the ~~example configuration in~~ exemplary embodiment of Fig. 23 so that the first 438 and second cam 440 are arranged on both axial sides of a radially extending disk 534 ~~running in a radial direction, which can make contact with the resection cam feed 448 or 450 outside in a radial direction.~~ 534, which are engaged from radially outside by the respective cam guide 448 or 450.

In a radial direction, there is ~~gap 536 or 538 that is free of material between the first 438 or second cam 440 and the feed casing 114.~~ A material free gap 536 or 538 is provided in radial direction between the first 438 or second cam 440 and the guide sleeve 114.

~~Furthermore~~ Furthermore, in the ~~configuration given~~ embodiment shown in Fig. 23, there are flanges 540, 542 are provided at the radial exterior radially outer end of the disk 534 ~~running in sections in the perimeter direction, which, for example, each run along a section of an orbit and are spaced with gaps 544, 546 in the perimeter direction.~~

which extend in positions of the circumference which, for example, each extend along a circular section and are circumferentially spaced by gaps 544, 546.

In the configuration shown in Fig. 23, the third cam 442 is formed ~~from~~by a top surface area of the ~~feed casing~~guide sleeve 114.

5 Fig. 24 shows a cutaway view of the ~~configuration~~embodiment shown in Fig. 23 along the line 24-24 displayed at a 90° rotation with the lid 102 removed.

Fig. 25 shows a cutaway view of the ~~configuration~~embodiment shown in Fig. 23 along the line 25-25 displayed at a 90° rotation.

10 Fig. 25 shows that the ~~feed casing~~guide sleeve 114 of the rotation ~~compartment~~rotatable insert 110 is connected as in one piece with the first cam 438.

Furthermore, Fig. 25 ~~shows~~shows a first cam ~~feed~~guide 448 rounded off radially outwardly in a radial direction and formed planar radially inwardly~~evenly inward in a radial direction~~. The first cam ~~feed~~guide 448 ~~enters~~extends into the gap 546 and, if necessary or possibly into the gap 544 at ~~the~~a corresponding ~~rotation~~rotational position
15 of the ~~rotation~~compartmentrotatable insert 110.

Fig. 26 shows a cutaway view of the ~~configuration~~embodiment shown in Fig. 23 along the line 26-26 displayed at a 90° rotation.

Fig. 26 illustrates that the ~~feed casing~~guide sleeve 114 of the rotation ~~compartment~~rotatable insert 110 is connected as in one piece with the second cam 440.

20 Furthermore, the second cam ~~feed~~guide 450 as shown in Fig. 26 is configured in such a way as it would be illustrated using Fig. 25 in relation to the first cam ~~feed~~guide 448.

Fig. 27 shows a cutaway view of the ~~configuration embodiment~~ shown in Fig. 23 along the line 27-27 displayed at a 90° rotation.

Fig. 27 shows that the third cam 442 is formed from an area of the feeding ~~case-guide sleeve~~ 114 or an area of the exterior ~~top-surface~~ of the feeding ~~case-guide~~ sleeve 114.

~~Fig.~~ Figs. 28 through 32 show different views or cutaway views of an ~~example configuration~~ exemplary embodiment of the invention that resemble the ~~configuration embodiment~~ illustrated in Fig. ~~Figs.~~ 18 ~~thru~~ through 22.

The configurations in Fig. ~~Figs.~~ 28 and 32, on the one hand, and Fig. ~~Figs.~~ 18 ~~thru~~ through 22, on the other hand, differ from each other, ~~besides geometry apart~~ from their geometry, and in particular the geometry of the cams 438, 440, 442, ~~through in~~ the relative arrangement of the first cam feed-guide 448 ~~opposite relative to~~ the second cam feed-guide 450.

Whereas these cam ~~feeds~~ guides 448, 450 and their standards perpendiculars in the ~~configuration in FIG.~~ embodiments of Figs. 18 ~~thru~~ through 22 ~~encircle and encompass~~ an angle of approximately 145 degrees, this angle in the ~~configuration in Fig.~~ embodiments of Figs. 28 ~~thru~~ through 32 is 120 degrees. It ~~can be is~~ noted, however, that other angle ratios may be preferred in accordance with ~~in the~~ invention.

Fig. 33 and 34 each show a partial cutaway of an ~~example configuration~~ exemplary embodiment of the invention in schematic form.

~~Fig.~~ Figs. 33 and 34 show an example of how the shape of the point 560 can be formed.

~~Fig.~~ Figs. 33 and 34 each show on one side a cross-section through a feed easing guide sleeve 114 and a section of this feed easing guide sleeve 114 with a section of a pencil 562 arranged in it.

In the ~~configuration embodiment~~ shown in Fig. 33, the ~~feed easing guide sleeve 114~~ has a wall thickness that is not constant in the ~~perimeter circumferential~~ direction. In this ~~example configuration, exemplary embodiment,~~ the thinnest wall thickness 564 is in the area of the small ~~main major~~ axis of the ~~ring shaped, annular,~~ elliptical cross-section and the thickest wall thickness 566 is in the area of the large ~~main major~~ axis.

A relatively flat point 560 of the pencil 562 to be sharpened – in comparison to the ~~configuration embodiment~~ in Fig. 34 - can be achieved by means of this ~~feed easing guide sleeve 114~~.

The ~~configuration embodiment~~ in Fig. 34 has a constant wall thickness of the ~~feed easing guide sleeve 114~~ in the ~~perimeter circumferential~~ direction.

The ~~feed easings guide sleeves 114~~ shown in ~~Fig Figs. 33 and 34~~ can be used in the ~~configurations embodiments~~ shown in ~~Fig Figs. 18 thru to 32~~.

I, JOACHIM T. FRITZ, living at 28 Woodview Cr., Gloucester, Ontario, K1B 3A9, Canada, and being a native of Germany having full knowledge of the German language, herewith certify that the attached translation is a true and complete translation into the English language of the German language document also attached hereto.

Signed this 10th day of November, 2004.



JOACHIM T. FRITZ